

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE SPECIFICATION**

**490 - TREE/SHRUB SITE PREPARATION**

**I. SCOPE**

Procedures, technical details and other information listed below provide additional guidance for planning selected components. This material supplements the criteria and considerations included in the Tree/Shrub Site Preparation Conservation Practice Standard.

**II. PLANNING REQUIREMENTS**

The Colorado State Forest Service is a registered Technical Service Provider (TSP) that can provide technical assistance to NRCS cooperators through local district foresters. Site preparation for woody plant establishment is usually an integral component of a forest and woodland management plan. Always check with the local district forester when making site-specific specifications on forestland.

All practices and procedures that involve ground-disturbing activities will comply with applicable cultural resource protection laws, regulations and policies.

**A. Types of Site Preparation:**

**1. Clearing or trampling using heavy machinery**

Some sites may contain logging slash or the remnants of an old windbreak, which requires removal to allow replanting with a planting machine. Clearing with a dozer is very effective, but costly. The debris may also be piled and burned in the winter when there is snow cover to prevent any chance of the fire escaping. Machine piling, however, reclassifies the types of piles created imposing more restrictive burning regulations. Often it is best, and least expensive, to pile or windrow the debris and simply let it decompose over time. In some cases, it may be desirable to clear planting spots or rows, rather than clearing the entire area. In other cases, it may be possible to hand plant right into the debris and completely avoid the cost of clearing.

**2. Chemical site preparation**

Existing vegetation in planting rows or spots can cause serious competition for new seedlings. Chemicals, normally contact herbicides, can eliminate or greatly reduce heavy stands of grass or weeds on the planting site. Always follow herbicide label instructions regarding application rates, environmental hazards and plant back restrictions. In most situations, it may be appropriate to spot treat only rows or planting spots. Vegetation between rows and surrounding planting spots if left in place can protect seedlings and help limit erosion.

When planning for chemical site preparation, remember that chemicals take some time to work. In many situations, it will be necessary to apply the chemicals the fall or summer prior to the planned tree or shrub planting. This is especially true if warm season grasses are present on the planting site. Poor control can result when treating warm season plants with contact herbicides in the early spring, as they do not begin active growth until late spring or early summer – after planting season has passed. If there are both warm and cool season grasses on the planting site, a split application may be appropriate to suppress warm season plants in the summer and cool season plants in the fall.

Refer to practice standards 314, Brush Management, or 595, Pest management, for applicable planning criteria.

### 3. Prescribed burning

Integrated site preparation can include the use of prescribed burning in conjunction with slash treatment methods such as lop and scatter. In a variety of forest types and conditions, prescribed burning removes woody biomass, litter and duff to allow for successful germination and establishment of trees and shrubs. Refer to practice standard 338, Prescribed Burning, for applicable planning criteria.

### 4. Tillage for site preparation

Existing vegetation can also be removed by disking, plowing, roto-tilling, or using some other form of mechanical tillage. Normally till only the planting rows to minimize the extent of areas subject to erosion.

Where rows must run up and down hills, it may be necessary to periodically lift the tillage equipment and leave a gap of undisturbed vegetation to help control potential erosion problems. Do not apply in-row tillage on slopes of 10 percent or more, although individual planting spots may be cultivated. Tillage works best when it is done during the summer or early fall before planting, with a light follow-up tillage just prior to planting. On very dry sites, summer fallowing, by keeping the site free of weeds and growing vegetation for the entire season prior to planting, will help to conserve moisture and provide the best possible start for the new seedlings.

## B. Other Site Preparation Considerations

### 1. Site preparation on sandy soils

Avoid extensive site preparation on very light or sandy soils since the potential for erosion is so great. Chemical suppression may be appropriate where a dense sod covers the site. Avoid mechanical tillage beyond 3 feet on each side of a tree or shrub row to minimize erosion, except where application of weed barriers require a wider tilled area. Apply mulches immediately after planting to prevent erosion and mitigate decreased water holding capacity.

### 2. Planting into crop residue

When establishing windbreaks or other plantings on cropland it is sometimes possible to plant into the stubble from the previous year's crop. Milo, corn and small stubble all make excellent planting locations and should not be disturbed prior to planting. Some cropland may contain significant amounts of carry-over herbicide residue and, in some cases, may require tillage and a fallow period reduce the amount of herbicide. If "weed barrier" mulch is to be used it may not be possible to retain the crop stubble in the planting rows where the mulch material will be placed. Even when the rows require tillage, it may be possible to leave the stubble between the rows.

## C. Site Preparation for Hand Planted Seedlings (Artificial Regeneration)

Preferred vegetation management is by spot or strip application of herbicide prior to planting date. Then plant seedlings in treated areas according to any herbicide label plant back restrictions.

If herbicides are not used, scalp an area three feet square of all vegetation. Then plant seedlings in the center of the scalped area.

## D. Seeding Disturbed Areas

Prepare the site by grading, removing heavy debris where possible, ripping compacted soils, grading for drainage and testing the fertility of the soil. All areas bare of vegetation and ground cover, and not expected to revegetate naturally within one growing season, should be seeded to an adapted ground cover.

To minimize the extent of concentrated flow areas, control surface water.

If needed, apply fertilizer according to soil test analysis. Incorporate fertilizer into soil surface.

Use certified seed, scarify and/or inoculate if necessary.

Apply seed by broadcast, drill or hydro-seeder. If seed is broadcast applied, double the seeding rate per Colorado NRCS Plant Materials Technical Note 59.

On slopes steeper than 20 percent, mulch with 2 to 2.5 tons of hay or straw per acre, or the equivalent of other materials such as small dimension logging slash.

#### E. Slash Treatment

Timber harvests normally produce significant amounts of "slash" including tops, limbs and defective logs. Slash treatment is an important consideration and should be addressed in the timber harvest plan. Treatment may involve simply "lopping and scattering" the slash evenly over the area. Cut down slash to a specified maximum height to help speed decomposition. Following pine harvests cut lopped and scattered slash until it lies within 18-24 inches of the ground. In some cases following clear cutting, dozer pulled roller-choppers and machine trampling can break up slash and put it in close contact with the soil to speed decomposition. Burning slash in place, or piling and burning also may be acceptable. Refer to practice standard 338, Prescribed Burning, for applicable planning criteria. If whole tree skidding is used, the cut trees will be skidded—tops and all—to a landing and then processed into logs. In that case, nearly all the slash will be concentrated around the landings. Slash piles at landings may sell as firewood or biomass fuel, or burned in place or simply left for wildlife use and decomposition. Untreated or poorly treated slash left in the woods can be unsightly, may cause elevated fire hazards in the years immediately following the harvest, restrict access to the area by livestock or humans and restrict natural regeneration and reforestation of the site.

Typically, slash is a problem that has to be treated, but it can provide benefits. Where it can be treated and left scattered on the site, it will decompose and provide nutrients for future tree growth. Integrated Forest Stewardship Plans may prescribe that logging contracts require the logger to protect standing dead trees (snags) or to girdle and leave standing a few trees per acre. While those standing trees may appear to be slash or logging residue, they can provide critical habitat for cavity nesting wildlife. In some cases, especially in hardwood stands, remaining slash can inhibit grazing and browsing damage to new seedlings. Some species of wildlife can also benefit from the protection provided by the tangle of branches and treetops that result from harvesting.

#### F. Use of Slash

The use of slash as a mat to mitigate gully erosion in concentrated flow areas and travel zones is encouraged, in conjunction with other established forestry best management practices.

#### G. Buffers

Plan and apply buffer strips, in accordance with local forestry best management practices on slopes above streams, other water bodies and watercourses for use during timber harvest to keep logging debris out of streams, filter sediment from runoff, prevent temperature increases by shading the stream and stabilize stream banks.

Refer to practice standards 393 - Filter Strip, 391 - Riparian Forest Buffer or 390 - Riparian Herbaceous Cover, for applicable planning criteria.

#### H. Weed Control

Nearly all tree and shrub plantings in Colorado will require follow-up weed control to ensure their success. Some plantings such as under-planting into an existing stand of trees, or establishing a block of trees and shrubs for wildlife cover, where varying levels of seedling survival could still provide acceptable benefits, might be successful without weed control. Most plantings will benefit from weed control and many will fail without it.

1. Chemical weed control

After the planting operation is complete (note: see label requirements), suppress weeds in tree rows or planting spots with herbicides labeled for that purpose. Pre-emergent herbicides intended to prevent the establishment of weed seedlings near the trees are perhaps the most commonly used. Spot treatment with contact herbicides that control weed seedlings after emergence also is an option. Always observe herbicide label requirements including environmental hazards statements. If used carelessly weed control chemicals can harm or kill seedling trees and shrubs and other desirable vegetation.

2. Mechanical weed control

Limit cultivation to the minimum needed to control weeds. Excess cultivation makes the area more susceptible to erosion and may damage the trees and shrubs by root pruning. A variety of tillage equipment and cultivators is acceptable to control weed growth around trees. Discs, roto-tillers and sweeps or other farm crop cultivators can be adapted to cultivating near tree rows. Specialized equipment designed for cultivation around trees also is available.

Whenever mechanical cultivation occurs near trees or shrubs, be careful to prevent damage to the above ground and below ground parts. Even small nicks are potential entrance points for disease. Since cultivation normally is conducted several times each season, and may be done over several years, even seemingly minor damage can add up to a serious problem. Operate cultivation equipment at a shallow depth to minimize disturbance and damage to tree root systems.

3. Mulch

Both artificial and natural mulches can provide effective weed control. Mulches offer the advantage of providing long-term weed control and soil moisture conservation with only one application.

Organic mulches may be effective for a season or two and products such as plastic "weed barrier" may last for five years or more. Apply mulch carefully to prevent damage to the seedlings. Organic mulches should be applied no more than 3 to 4 inches in depth. Deep beds of mulch can provide habitat for voles, or other rodents that may feed on bark and damage or kill trees and shrubs.

I. Animal Damage Management

Prevent livestock from grazing any newly seeded areas. Refer to practice standard 472 - Access Control, for applicable planning criteria.

J. Access, Skid Trails and landing Location and Design

Roads and major skid trails will be located to serve the purpose of preparing the site for establishing a forest, and help control the flow of surface water to minimize erosion. Refer to Forest Trails and Landings.

### III. OPERATION AND MAINTENANCE

Maintain erosion control measures as necessary.

Control locally invasive and noxious plants as necessary. If pesticides are used, refer to the standard Pest Management, 595, for applicable planning criteria.

Control access by vehicles or equipment during or after site preparation to minimize erosion, compaction and other site impacts. Refer to the standard Use Exclusion, 472, for applicable planning criteria.